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From: Commandant of the Marine Corps  
To: Distribution List

Subj: AVIATION TRAINING AND READINESS (T&R) MANUAL, F-5  
(SHORT TITLE: F-5 T&R MANUAL)

Ref: (a) MCO P3500.14G

Encl: (1) LOCATOR SHEET

1. Purpose. To publish policies, procedures and standards regarding the training of F-5 aircrew, per reference (a).
2. Cancellation. T&R Manual, MCO P3500.17, Volume 4, Chapter 16.
3. Background. Reference (a) restructures the T&R manual organization from nine volumes to 25 individual Marine Corps orders.
4. Recommendations. Recommended changes to this order are invited, and will be submitted via the syllabus sponsor and the appropriate chain of command to: Commanding General, Training Command (C 473), Marine Corps Combat Development Command, 3300 Russell Road, Quantico, VA 22134-5001.
5. Reserve Applicability. This manual is applicable to the Marine Corps Reserve.
6. Certification. Reviewed and approved this date.

T. S. JONES  
By direction

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## F-5 T&amp;R MANUAL

## RECORD OF CHANGES

Log completed change action as indicated.

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# F-5 T&R MANUAL

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### CHAPTER

1

F-5 PILOT





# F-5 T&R MANUAL

## CHAPTER 1

### F-5 PILOT

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**\* \* N O T E \* \***

*Aircrew coordination will be briefed for all flights and aircrew positions.*

## CHAPTER 1

F-5 PILOT100. PROGRAMS OF INSTRUCTION

101. CONVERSION PILOT. All pilots shall have a tactical jet background. Air Combat Tactics Instructor designation is required.

<u>Weeks</u>	<u>Course</u>	<u>Activity</u>
1-2	Ground School, Mission Capable Training	VMFT-401/VFC-13
3-5	Mission Ready Training	VMFT-401
6-12	Mission Qualification Training	VMFT-401
12-16	Full-Mission Qualification Training	VMFT-401

102. REFRESHER PILOT. Greater than 12 months since last F-5 flight.

<u>WEEKS</u>	<u>COURSE</u>	<u>ACTIVITY</u>
1-2	Ground School, Mission Capable Refresher Training	VMFT-401
3-4	Mission Ready Training	VMFT-401

103. INSTRUCTOR UNDER TRAINING (IUT)

<u>WEEKS</u>	<u>COURSE</u>	<u>ACTIVITY</u>
1	Instructor Under Training	VMFT-401

110. GROUND TRAINING111. COURSES OF INSTRUCTION

<u>COURSE</u>	<u>ACTIVITY</u>
F-5 Aircraft System	USAF/VMFT-401
Adversary Pilot Syllabus	MAWTS-1/VMFT-401
Threat Weapons	MAWTS-1/VMFT-401
Threat Tactics	MAWTS-1/VMFT-401
Fighter Performance	MAWTS-1/VMFT-401
Helicopter Performance/Tactics	MAWTS-1/VMFT-401
Low Altitude Tactics Syllabus	MAWTS-1/VMFT-401

112. SIMULATOR TRAINING. No F-5 flight simulator is available at MCAS Yuma. Cockpit procedures trainer, if available, will be utilized prior to the first flight of mission capable training.

113. SQUADRON LEVEL TRAINING. Training will include, but not be limited to, an adversary and LAT training syllabus conducted by VMFT-401 and MAWTS-1.

120. FLIGHT TRAINING. The Conversion, Refresher, and Instructor courses of instruction are contained herein. Due to the nature of the adversary support mission, all F-5 pilots will possess a 7523 MOS and ACTI designation. VMFT-

401 does not possess the facilities nor equipment to conduct Basic or Transition training. Figure 1-1 provides refly interval and mission readiness percentage.

1. Conversion Pilot

a. Mission Capable Training

<u>Stage</u>	<u>FLIGHTS</u>	<u>HOURS</u>	<u>PERCENT</u>
Basic Qualification	-	-.-	25.0
Familiarization	7	5.6	24.5
Instruments	1	1.0	3.5
Air Intercept	<u>2</u>	<u>2.4</u>	<u>7.0</u>
	10	9.0	60.0

b. Mission Ready Training

<u>Stage</u>	<u>FLIGHTS</u>	<u>HOURS</u>	<u>PERCENT</u>
Instruments	1	1.0	0.5
Air-To-Air	11	8.8	11.0
Air Intercept	2	2.0	1.0
Navigation	1	0.8	0.5
Low Altitude Tactics	<u>4</u>	<u>3.2</u>	<u>2.0</u>
	19	15.8	15.0

c. Mission Qualification Training

<u>Stage</u>	<u>FLIGHTS</u>	<u>HOURS</u>	<u>PERCENT</u>
Air-To-Air	7	5.6	10.5
Surface Attack	1	0.8	1.5
Helicopter Attack	3	2.4	5.0
Strike Intercept	<u>2</u>	<u>1.6</u>	<u>3.0</u>
	13	10.4	20.0

d. Full-Mission Qualification Training

<u>Stage</u>	<u>FLIGHTS</u>	<u>HOURS</u>	<u>PERCENT</u>
Air-To-Air	6	4.8	3.0
Helicopter Attack	1	0.8	1.0
Anti-Air Warfare	<u>2</u>	<u>1.6</u>	<u>1.0</u>
	9	7.2	5.0
Total	51	42.4	100.0

2. Refresher Pilota. Mission Capable Training

<u>Stage</u>	<u>FLIGHTS</u>	<u>HOURS</u>	<u>PERCENT</u>
Basic Qualification	-	-.-	46.0
Familiarization	3	2.4	10.5
Instruments	<u>1</u>	<u>1.0</u>	<u>3.5</u>
	4	3.5	60.0

b. Mission Ready Training

<u>Stage</u>	<u>FLIGHTS</u>	<u>HOURS</u>	<u>PERCENT</u>
Instruments	1	1.0	0.5
Air-To-Air	11	8.8	11.0
Air Intercept	2	2.0	1.0
Navigation	1	0.8	0.5
Low Altitude Tactics	<u>4</u>	<u>3.2</u>	<u>2.0</u>
	19	15.8	15.0

c. Mission Qualification Training

<u>Stage</u>	<u>FLIGHTS</u>	<u>HOURS</u>	<u>PERCENT</u>
Air-To-Air	7	5.6	10.5
Surface Attack	1	0.8	1.5
Helicopter Attack	3	2.4	5.0
Strike Intercept	<u>2</u>	<u>1.6</u>	<u>3.0</u>
	13	10.4	20.0

d. Full-Mission Qualification Training

<u>Stage</u>	<u>FLIGHTS</u>	<u>HOURS</u>	<u>PERCENT</u>
Air-To-Air	6	4.8	3.0
Helicopter Attack	1	0.8	1.0
Anti-Air Warfare	<u>2</u>	<u>1.6</u>	<u>1.0</u>
	9	7.2	5.0
Total	45	36.8	100.0

141. MISSION CAPABLE TRAINING1. Familiarization

a. Purpose. To develop proficiency and familiarity with aircraft flight characteristics, limitations, emergency procedures, and maneuvering envelope including all authorized aerobatics.

b. General

(1) All flights in familiarization stage with the exception of INST 110, shall be flown during daylight hours.

(2) All FAM flights shall be led by a designated F-5 FAM instructor or may be flown in a F-5F.

(3) Prior to commencing syllabus training, pilots shall:

- (a) Complete F-5 ground school.
- (b) Successfully complete the open and closed book F-5 NATOPS examinations.
- (c) Review the F-5 departure/spin video tape.
- (d) Receive the F-5 Northrop seat brief to include aeromedical aspects.
- (e) Be qualified and current for flight in naval aircraft.
- (f) If no F-5F is available FAM 104 will be the last flight flown in the mission capable stage.

c. Flight Training (7 Flights, 5.6 Hours)

FAM-99      NO FLIGHT      1 F-5F/1 F-5E

Goal. Introduce F-5 ground operations and preflight.

Requirement. Demonstrate aircraft preflight inspection, cockpit and parachute preflight inspection, start and line procedures.

FAM-100      0.8      1 F-5F

Goal. Introduce F-5 flight characteristics, maneuvers and landing pattern.

Requirement. Perform A/B takeoff, aerobatics to include: Aileron roll, wing over, barrel roll, loop(450 to 500), Immelmann, split S. Introduce inverted pitch hang-up recovery, pushover, clean and dirty stall recovery, accelerated stall recovery, airborne shutdown and air start, emergency landing gear release, field entry, and full flap landings.

FAM-101      0.8      1 F-5F

Goal. Introduce F-5 flight characteristics, maneuvers and landing pattern.

Requirement. Perform Tiger start, A/B takeoff, review aerobatics, introduce hard and break turns(with/without flaps), acceleration exercise (loaded/unloaded), rudder rolls, PAR approach, simulated single engine approach, no flap landings, full flap landings, drag chute full stop landings.

FAM-102      0.8      2 F-5/1 F-5F

Goal. Introduce F-5 flight characteristics, maneuvers and landing pattern.

Requirement. Perform A/B takeoff, MRT climb, high and slow speed maneuvering, loops and barrel rolls. Hard and break turns, GCA to multiple touch and go landings, and full stop with no less than 1,000 lbs. Lead brief crosswind landing

technique. If several FAM-102 sorties are flown concurrently, a single chase is acceptable provided ground and flight procedures are briefed with all participants as well as emergency procedures and area deconfliction.

FAM-103      0.8              2 F-5/1 F-5F

Goal. Further familiarization of pilot with F-5 flight characteristics, maneuvers and landing pattern.

Requirement. A/B takeoff. Practice aerobatics to include 400/450 KIAS loops starting at 10K. Split S starting at 20K and 270 to 300 KCAS. Level, acceleration from 250 to 400 KCAS with flaps in maneuver, flaps up, and unloaded flaps up. Note time for each. Section GCA/ILS to multiple touch and go landings. Full stop with no less than 1,000 lbs. If several FAM-103 events are flown concurrently a single chase is acceptable provided ground and flight procedures are briefed with all participants as well as emergency procedures and area deconfliction.

FAM-104      0.8              R 2 F-5/1 F-5F

Goal. F-5 flight envelope exploration.

Requirement. Review A/B take off, turn performance exercise. Introduce zero airspeed maneuver, vertical egg, flat scissors, rolling scissors, and guns defense. Review field entry/break, and full flap landings. If an F-5F is not available for this flight, a dedicated attached chase is required for each FAM-104 flight.

FAM-105      0.8              R 2 F-5

Goal. Further familiarization of flight characteristics, maneuvers and landing pattern.

Requirement. A/B take off, flight lead separation with 10 second interval, practice formation flight to include two carrier rendezvous'. Introduce tail chase with increasing difficulty. Lead demo guns defense. Return to overhead for multiple touch and go's. Full stop with no less than 1,000 lbs.

FAM-106      0.8              R 2 F-5

Goal. Further familiarization of the pilot under instruction (PUI) with increasingly difficult maneuvers.

Requirement. A/B take off, flight lead separation. Practice formation flight to include combat spread and Soviet formations. Perform tail chase and advantage/disadvantage maneuver. RTB to break and multiple touch and go's, and landing with no less than 1,000 lbs.

## 2. Instruments

a. Purpose. To develop the ability to execute precision maneuvers under instrument conditions, comply with IFR procedures, and utilize all installed NAVAIDS.

b. General. Inst-110 may be flown as the first night event of this syllabus.

c. Flight training (1 Flight, 1.0 Hour)

INST-110      1.0              R 1 F-5E/1 F-5F

Goal. Practice instrument procedures and airways navigation.

Requirement. Fly a round robin instrument stereo route, instrument recovery, multiple GCA's/ILS.

3. Air Intercept

a. Purpose. To introduce and develop proficiency in airborne intercept procedures in the F-5.

b. General

(1) Prior to first flight, PUI will receive a class covering radar operation and techniques, intercept geometry and weapons systems employment.

(2) Air Intercept sorties should be flown on the TACTS range to the maximum extent possible.

(3) Captive missiles should be carried on each flight.

(4) Minimum Altitude: 1000 ft AGL day; 5,000 ft AGL night.

c. Flight Training (2 Flights, 2.4 Hours)

AI-120              1.2              2 F-5E

Goal. Introduce PUI to airborne radar operation and presentations in the beam and rear quarter environments.

Requirement. Introduce three rear quarter intercepts from 5 NM trail, PUI will close to 1/2 NM co-speed. One run should be in search only. Conduct three successful intercepts from a beam position achieved. Target will be positioned at 2,000 ft above the fighter and 300 knots.

AI-121              1.2              2 F-5E

Goal. Intercept radar displays, intercept geometry in the forward quarter achieving both radar and rear quarter IR firing parameters.

Requirement. Conduct multiple medium altitude (15,000 to 20,000 ft) forward quarter (0 to 30 degree TA) culminating with radar launch, and rear quarter IR attacks. Bogey + 2,000 ft above the fighter, fighter + 25 KIAS advantage.



142. MISSION READY TRAINING1. Instruments

a. Purpose. To maintain currency and proficiency in flying in IMC flying and airways navigation.

b. General. Use of this flight as a refresher event, or a NATOPS/INST check or area FAM is encouraged.

c. Flight training (1 Flight, 1.0 Hour)

INST-200      1.0      R 1 or more F-5(day or night)

Goal. Maintain instrument proficiency.

Requirement. Perform airways navigation in accordance with existing instrument flight rules. Perform a minimum of one TACAN approach and one GCA/ILS.

2. Air-to-Air

a. Purpose. To introduce and develop proficiency in offensive and defensive maneuvering of the F-5 against similar and dissimilar bogies.

b. General

(1) All flights must be lead by a designated AT(I) if any member of the flight is not ACM qualified or not a designated adversary tactics pilot.

(2) AA-215 must be successfully completed before continuing in this stage.

(3) Starting with AA-213, one engagement of each flight will emphasize use of forward quarter infra-red tactics and counter tactics.

c. Flight Training (11 Flights, 8.8 Hours)

AA-210      0.8      R 2 F-5

Goal. Practice defensive first move options.

Requirement. Practice gun sight tracking enroute to the area. Defensive starts with instructor or offensive perch to role reversal.

AA-211      0.8      R 2 F-5

Goal. Practice offensive maneuvering.

Requirement. Practice Soviet formations enroute to the area. Perform the 180\* guns drill. Practice offensive maneuvering from a perch setup.

AA-212      0.8      R 2 F-5

Goal. Review offensive and defensive maneuvering.

Requirement. Perform tail chase enroute to the area. Perform two offensive setups and two defensive setups.

- AA-213      0.8      R 2 F-5
- Goal.    Introduce neutral setups.
- Requirement.    PUI shall brief and lead. Practice first move options from neutral starts to include energy fight, position fight and mirror fight.
- AA-214      0.8      R 2 F-5
- Goal.    Review neutral maneuvering.
- Requirement.    Pilot under instruction shall brief and lead. Practice first move options from neutral setups.
- AA-215      0.8      R,E 2 F-5
- Goal.    Evaluate progress in AA stage.
- Requirement.    PUI shall brief and lead. Review all previously discussed maneuvers.
- AA-216      0.8      R 1 F-5
- Goal.    Offensive and defensive maneuvering against a dissimilar aircraft.
- Requirement.    Practice first move options from offensive and defensive setups. Emphasis on quick kills and bugouts.
- External Syllabus Support.    One dissimilar adversary (CAT2/3).
- AA-217      0.8      R 1 F-5
- Goal.    Introduce neutral maneuvering against a dissimilar aircraft.
- Requirement.    Practice first move options from neutral setup. Emphasis on ability to drive fight, quick kills and bugouts.
- External Syllabus Support.    One dissimilar adversary (CAT4).
- AA-218      0.8      R 1 F-5
- Goal.    Introduce neutral and offensive maneuvering against a superior aircraft.
- Requirement.    Practice first move options from neutral and offensive setups. Emphasis on quick kills, survivability and bugouts.
- External Syllabus Support.    One dissimilar adversary (CAT4).
- AA-219      0.8      R 3 F-5
- Goal.    Introduce multi-bogey environment through 1v1v1 engagements.

Requirement. Perform lvlvl engagements from neutral setups, emphasis on lookout doctrine, energy management, weapons employment, fuel management and bugouts.

AA-220      0.8      R 1 F-5

Goal. Introduce offensive and defensive maneuvering against a section of bogies.

Requirement. Practice single ship offensive and defensive maneuvering from neutral and offensive setups.

External Syllabus Support. 2 dissimilar adversaries.

### 3. Air Intercept

a. Purpose. To introduce low altitude and section intercept procedures in the F-5.

#### b. General

(1) Air intercept sorties should be flown on the TACTS range to the maximum extent possible.

(2) Captive missiles should be carried on each flight.

(3) Minimum altitude: 1,000 ft AGL day, 5,000 ft AGL night.

(4) Bogies may be dissimilar aircraft.

(5) Three successful intercepts are required for completion of each flight.

#### c. Flight Training (2 Flights, 2.0 Hours)

AI-230      1.0      R 2 F-5E

Goal. Obtain proficiency in analyzing and intercepting an unknown target.

Requirement. Conduct forward quarter attacks with stern reattacks from a forward quarter setup against an unknown target with 30 NM separation, the fighter will be based at 15,000 ft/400 knots with the bogey at 18,000 ft/400 knots. The bogey will leave assigned CAP at an unknown heading, altitude, and airspeed within the following parameters: +/- 30 degrees heading, +/- 5,000 ft altitude, and +/- 100 knots airspeed. One intercept should be made with target below 5,000 ft MSL.

AI-231      1.0      R 2 F-5E

Goal. Introduce section intercept tactics and procedures against a known number of adversaries.

Requirement. Perform multiple forward quarter attacks with rear quarter re-attacks against multiple bogies in line abreast or trail formation. Fighters will be based at 15,000 ft/350 knots with bogies at 18,000 ft/350 knots. The bogies will leave the assigned CAP at an unknown heading, altitude and airspeed, within the following parameters: +/-

30 degrees heading, +/- 5,000 feet altitude, and +/- 100 knots airspeed. Bogies should remain within 10 NM's of each other in trail formation.

External Syllabus Support. Two similar/dissimilar adversaries.

#### 4. Navigation

a. Purpose. To introduce the pilot to low altitude flying and visual navigation.

##### b. General

(1) Emphasize the low altitude flight characteristics and aircraft handling of the F-5 in preparation for the LAT stage.

(2) Minimum altitude is 500 ft AGL.

##### c. Flight Training (1 Flight, 0.8 Hours)

<u>NAV-240</u>	<u>0.8</u>	<u>R 2 F-5/1 F-5F</u>
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Goal. Plan and execute a low level route utilizing DR navigation and visual checkpoints.

Requirement. Thoroughly plan a low level route. Emphasis on aircraft handling, fuel management, and map interpretation.

#### 5. Low Altitude Tactics

a. Purpose. To develop proficiency in low level, high speed flight on a closed LAT circuit; to include level high "g" turns, ridgeline crossings, terrain masking and low altitude section maneuvering. The pilot should be designated as LAT qualified upon successful completion of this stage.

##### b. General

(1) Flight conducted on an authorized low altitude training circuit. The circuit should be 10 to 15 minutes in length.

(2) Prerequisites for this stage are successful completion of NAV-240 and the appropriate LAT lectures.

(3) Initial qualification or requalification on LAT-253.

(4) Pilots current and qualified in LAT do not require a chase. T&R Manual Volume 1 describes currency requirements.

(5) Various types of terrain should be utilized where feasible.

(6) Absolute minimum altitude will be 500 ft AGL.

(7) Pilots will complete each mission successfully in the sequence listed.

(8) It should be emphasized that the concept of low altitude tactics is designed around "comfort level" (CL) and "minimum altitude capable" (MAC). Altitudes achieved are not to be considered as criteria for success.

c. Flight Training (4 Flights, 3.2 Hours)

LAT-250      0.8      R 2 F-5/1 F-5F

Goal. Introduce pilot to low altitude tactics (LAT) in the F-5 with emphasis on terrain masking, ridgeline crossing technique, NAV turns and defensive maneuvers at CL.

Requirement. Conduct a LAT flight to include: straight and level accelerations/decelerations, NAV turns, defensive break turns at comfort level, ridgeline crossings and terrain masking.

LAT-251      0.8      R 2 F-5/1 F-5F

Goal. Develop proficiency in single section LAT.

Requirement. Perform all maneuvers from LAT-250. Second circuit performed comm out, PUI is responsible for navigation.

LAT-252      0.8      R 2 F-5

Goal. Introduce the pilot to section LAT.

Requirement. Perform all maneuvers from LAT-250 in section. Fly the first circuit as lead and the second circuit as wingman.

LAT-253      0.8      R,E 2 F-5

Goal. Develop proficiency in section LAT. At the completion of this flight the commanding officer can designate the pilot LAT qualified.

Requirement. Repeat LAT-252.

143. MISSION QUALIFICATION TRAINING1. Air-to-Air

a. Purpose. To develop proficiency in the employment of known or potential enemy formations, engaged tactics, and armament.

b. General

(1) GCI and separate frequencies should be utilized to the greatest extent possible.

(2) TACTS should be utilized whenever possible.

(3) Upon successful completion of AA-300 through AA-305E the pilot is considered ACM qualified and can conduct ACM per the T&R Manual, Administrative.

(4) Upon successful completion of the entire mission qualified syllabus the pilot shall be designated (at the discretion of the commanding officer) an adversary tactics pilot and can conduct ACM per T&R Manual, Administrative.

(5) Until a pilot is ACM qualified all ACM flight must be lead by a designated ATI.

(6) U.S. tactics will not be used unless specifically requested by adversaries.

c. Flight Training (7 Flights, 5.6 Hours)

AA-300            0.8            R 2 F-5

Goal. Introduce known and potential Fishbed intercept tactics, emphasis on Fishbed formations.

Requirement. Perform intercepts and canned setups to engagements under GCI control (if available). Wingman concentrates on flying Fishbed formations until cleared to engage by lead. Emphasis on proper visual employment of Fishbed armament.

External Syllabus Support. Two dissimilar adversaries.

AA-301            0.8            R 2 F-5

Goal. Introduce Fishbed decoy tactics and separate vector attacks against adversary CAPS/SWEEPS.

Requirement. Perform intercepts (and canned setups) to engagements under GCI control (if available). Emphasis on decoy tactics and separate vector considerations.

External Syllabus Support. Two dissimilar adversaries.

AA-302            0.8            R 2-4 F-5

Goal. Introduce basic Flogger close control tactics and forward quarter IR tactics/countertactics against adversary CAPS/SWEEPS.

Requirement. Perform intercepts under GCI control (if available) to engagements, emphasis on known Flogger tactics, introduce known or suspected forward quarter IR tactics/countertactics, and use of F-5 to simulate Flogger.

External Syllabus Support. Two dissimilar adversaries.

AA-303            0.8            R 2-4 F-5

Goal. Practice Flogger intercept and forward quarter engagement tactics.

Requirement. Perform known radar tactics during intercept to forward quarter engagement. Emphasis on tactical cooperation, situation awareness, use of F-5 to simulate Flogger, and proper employment of Flogger forward quarter armament.

External Syllabus Support. Two dissimilar adversaries.

AA-304            0.8            R 4 F-5

Goal. Conduct Fishbed or Flogger tactics under GCI control (if available).

Requirement. Perform known or potential Fishbed or Flogger style intercepts to engagements. Emphasis on proper employment of section/division against adversary CAP. Practice sweeps, section integrity, visual search techniques, and engaged tactics.

External Syllabus Support. Two to four dissimilar adversaries.

AA-305      0.8      R E 2-6 F-5

Goal. Evaluate advanced Fishbed and Flogger intercept tactics.

Requirement. F-5 will use advanced Fishbed and Flogger tactics on all intercepts. Maximum intercept training is desired. PUI will brief and lead.

External Syllabus Support. Two to four dissimilar adversaries.

AA-306      0.8      R 2-6 F-5

Goal. Conduct intercepts and/or visual setups against multiple adversaries utilizing multiple sections or divisions.

Requirement. Conduct multiple engagements in a sterile environment, emphasizing shots of opportunity, disengagement, survivability and section or division integrity.

External Syllabus Support. Two to six dissimilar adversaries.

## 2. Surface Attack

a. Purpose. To develop proficiency in employing the F-5 in the surface attack role.

### b. General

(1) Emphasis will be placed on developing proficiency in non-U.S. style tactics.

(2) No ordnance will be carried other than captive AA missile.

(3) ECM should be used (if available and requested).

(4) Flight below 500 ft AGL is not authorized.

### c. Flight Training (1 Flight, 0.8 Hours)

SA-320      0.8      R 2(or more)F-5

Goal. Develop proficiency in employing U.S. and non-U.S. section tactics against a surface target(s).

Requirement. Perform multiple attacks against a surface target(s). Emphasize using known or potential non-U.S.

tactics. Should include, but is not limited to, timed attacks with sequential reattacks.

### 3. Helicopter Attack

a. Purpose. To develop proficiency in employing the F-5 against a helicopter threat.

#### b. General

(1) All flights will adhere to T&R's and ACM flights requirements per T&R Manual, Administrative and OPNAVINST 3710.7.

(2) Pilot must be ACM qualified as outlined in this chapter.

(3) Pilot must be LAT qualified as outlined in this chapter and LAT current as outlined in T&R Manual, Administrative.

(4) Pilot must brief/debrief coordination and control procedures, threat counter procedures, and offensive procedures during their individual briefs and during the common debrief.

(5) Emphasis will be placed on developing proficiency in U.S. and non-U.S. tactics as well as simulated employment of U.S. and non-U.S. armament.

(6) These events should be flown in conjunction with related helicopter ACM syllabus events.

#### c. Flight Training (3 Flights, 2.4 Hours)

HA-330

0.8

R 1 F-5

Goal. Introduce lvl maneuvering in the F-5 against a maneuvering helicopter.

Requirement. Conduct visual attacks against a helicopter utilizing either air-to-air or air-to-ground ordnance (simulated).

External Syllabus Support. One helicopter.

HA-331

0.8

R,E 2 F-5

Goal. Develop proficiency in employing section tactics against multiple maneuvering helicopters.

Requirement. Conduct visual attacks against multiple maneuvering helicopters. Emphasize the use of non-U.S. tactics and armament (unless otherwise requested).

External Syllabus Support. Two or more helicopters.

HA-332

0.8

R,E 1 F-5

Goal. Develop proficiency in employing single ship tactics against multiple maneuvering helicopters.

Requirement. Conduct visual attacks against multiple maneuvering helicopters utilizing single ship tactics. Emphasize the use of non-U.S. tactics and armament (unless otherwise requested).



External Syllabus Support. Two or more helicopters.

#### 4. Strike Intercept

a. Purpose. To develop proficiency in employing U.S. and non-U.S. tactics and armament against multi-plane strike formations in a medium-to-low altitude environment.

##### b. General

(1) Flight below 500 feet AGL is not authorized.

(2) Special attention shall be paid to the training rules listed in the T&R Manual.

(3) Pilots must brief/debrief coordination and control procedures, threat counter procedures, and offensive procedures during their individual briefs and during the common debrief.

(4) Special emphasis shall be placed on developing proficiency in the use of non-U.S. tactics and weapons employment.

(5) Use of GCI is encouraged but not required.

##### c. Flight Training (2 Flights, 1.6 Hours)

SI-340

0.8

R 1 or more F-5

Goal. Introduce single ship/section tactics against multi-plane strike formations.

Requirement. Conduct visual attacks against low-to-medium altitude multi-plane strike formations during ingress or egress. Emphasize the use of non-U.S. tactics and weapons employment.

External Syllabus Support. Four or more dissimilar adversaries.

SI-341

0.8

R 3 or more F-5

Goal. Develop proficiency in employing division tactics against multi-plane strike formations.

Requirement. Utilizing non-U.S. concepts of vital area defense, conduct visual attack against medium-to-low altitude multi-plane strike formations. Emphasize the use of non-U.S. division tactics and weapons employment.

External Syllabus Support. Four or more dissimilar adversaries.

#### 144. FULL-MISSION QUALIFICATION TRAINING

##### 1. Air-to-Air

a. Purpose. To further develop proficiency in utilizing threat tactics to successfully intercept, engage, and disengage from adversary aircraft.

b. General

(1) Due to the complex nature of these flights, flight leads shall be designated ATI's.

(2) All general comments from previous air-to-air training apply to this stage.

(3) GCI should be used to enhance realism.

c. Flight Training (6 Flights, 4.8 Hours)

AA-410

0.8

R 4 F-5

Goal. Introduce composite force tactics.

Requirement. Using either U.S. or non-U.S. composite force tactics, intercept, engage, and negate adversary air superiority force. Emphasize composite force consideration, engaged tactics, and weapons employment.

External Syllabus Support. Two to four friendly strike aircraft and two to four dissimilar adversaries.

AA-411

0.8

R 4-6 F-5

Goal. Practice advanced Fishbed intercept and engagement techniques in a realistic multi-aircraft air superiority environment.

Requirement. Utilizing known and potential advanced Fishbed tactics; intercept, engage, and disengage from adversary CAP/SWEEPS. Emphasize intercept techniques, and Fishbed armament employment.

External Syllabus Support. Two or more dissimilar adversaries.

AA-412

0.8

R 4-6 F-5

Goal. Practice advance Flogger intercept and engagement techniques in a realistic multi-aircraft air superiority environment.

Requirement. Utilizing known and potential Flogger tactics; intercept, engage, and disengage from adversary CAP/SWEEPS. Emphasize intercept techniques, BVR shot opportunities, disengagement techniques, and Flogger weapons employment.

External Syllabus Support. Two or more dissimilar adversaries.

AA-413

0.8

R 6-8 F-5

Goal. Practice multi-division advanced threat tactics.

Requirement. Utilizing known or potential multi-division advanced threat tactics; intercept, engage, and disengage from adversary CAPS/SWEEPS. Emphasis on tactical cooperation, rapid kills, and situation battle awareness.

External Syllabus Support. Four or more dissimilar adversaries.

AA-414      0.8      R 6-8 F-5

Goal. Practice multi-division advanced threat tactics.

Requirement. Intercept and disengage from adversary CAP/SWEEPS utilizing known or potential multi-division Flogger tactics. Emphasis on BVR shot opportunities, minimum in-close maneuvering, and disengagement techniques.

External Syllabus Support. Four or more dissimilar adversaries.

AA-415      0.8      R 8-12 F-5

Goal. Practice threat squadron tactics.

Requirement. Using known or potential threat squadron tactics, intercept and negate an adversary air superiority force. Emphasis is on intercept technique, BVR shot opportunities, minimum in close maneuvering, and disengagement techniques.

External Syllabus Support. Four or more dissimilar adversaries.

## 2. Helicopter Attack

a. Purpose. To gain exposure to threat tactics relating to rotary wing aircraft.

b. Flight Training (1 Flight, .08 Hour)

HA-420      0.8      R 2(or more) F-5

Goal. Practice threat tactics against large numbers of helicopters.

Requirement. Conduct visual attacks on multi-plane helo formations. Emphasize use of non-U.S. division tactics, mutual support, direct and sequential attacks. Various SAM threat scenarios should be simulated.

External Syllabus Support. An unknown number of helicopters with or without escort.

## 3. Anti-Air Warfare

a. Purpose. To develop proficiency in planning and executing the airborne portion of an IADS.

b. General

(1) Due to the complex nature of these flights the mission commander shall be a designated ATI and flight leads shall be designated ATP's.

(2) When appropriate, non-U.S. tactics shall be utilized.

(3) All general comments from previous air-to-air training apply to this stage.

c. Flight Training (2 Flights, 1.6 Hours)

AAW-430

0.8

R 2 or more F-5

Goal. Develop proficiency in simulating U.S. and non-U.S. strike escort tactics.

Requirement. Plan and execute a coordinated strike into a simulated sophisticated threat environment. Emphasize (when appropriate) non-U.S. strike escort tactics.

External Syllabus Support. Two or more friendly strike aircraft vs two or more dissimilar adversaries.

AAW-431

0.8

R 2 or more F-5

Goal. With the help of a ground based air defense unit, defend a vital area against a coordinated strike.

Requirement. Plan and execute a non-U.S. style IADS. Emphasize the use of SAM's in the IADS. When appropriate, utilize non-U.S. concepts of vital area defense.

External Syllabus Support. An unknown number of dissimilar adversaries.

150. INSTRUCTOR AND SPECIAL FLIGHT PERFORMANCE REQUIREMENTS

151. ADVERSARY TACTICS INSTRUCTOR COURSE

1. Purpose. To certify pilots capable of conducting ground and airborne instruction of adversary air combat maneuvers, threat weapons, surface attack tactics, and help attack tactics as well as the flight envelope of the F-5.

2. General

a. Conduct ground and airborne instruction of air combat maneuvers and the F-5 envelopes.

b. Conduct ground and airborne instruction in use of the F-5 as a threat simulator.

c. Brief, lead, and debrief (as an adversary) tactical flights against Fleet and Reserve squadrons.

d. Fulfill the safety/leadership requirements for ACM per T&R Manual, Administrative and OPNAVINST 3710.7.

e. Squadron academics syllabus:

(1) F-5 flight characteristics/limitations.

(2) Briefing and debriefing.

(3) F-5 as a threat simulator.

(4) Threat formations and tactics.

(5) Threat air-to-air weapons.

(6) ACM ROE.

(7) Examination.

### 3. Flight Training (3 Flights, 2.4 Hours)

a. Flight syllabus. An F-5 ATI will conduct the build-up phase to prepare the prospective ATI for certification by the commanding officer. The prospective ATI will demonstrate the capability to: brief, debrief, and instruct basic tactical maneuvers in a 1v1, and a multi-plane scenario. The build-up should include the following events:

(1) 1v1 similar - offensive and defensive setups.

(2) 1v1 similar - neutral setups.

(3) 1v1 dissimilar - offensive, defensive, and neutral setups.

(4) One (1) 2v2 or greater - emphasis on threat formation, tactics, and weapon simulation and debrief.

(5) One (1) 4vX utilizing complex flogger tactics with emphasis on intercept presentation and debrief.

b. The prospective ATI will demonstrate to the squadron instructor the ability to brief, lead, and debrief the following flights:

AA-500

0.8

E 1 F-5

Goal. Evaluate the prospective ATI's ability to brief, conduct and debrief a 1v1 dissimilar/similar flight.

Requirement. Conduct eye ball calibration drill, guns weave exercise, at least one offensive, defensive, or neutral setup, and guns defense. Additional emphasis placed on the brief and debrief.

External syllabus support. One similar or dissimilar adversary.

AA-501

0.8

E 2 F-5

Goal. Evaluate the prospective ATI's ability to successfully/safely conduct and control, brief and debrief a 2v2 dissimilar flight.

Requirement. Conduct at least two setups from beyond visual range utilizing GCI or TACTS (if available). Emphasis should be placed on pre-merge radar missile employment and defense to a IR reattack or disengagement. Conduct at least one visual setup with emphasis placed on quick kills and disengagement. Additional emphasis placed on the brief and debrief.

External syllabus support. Two dissimilar adversaries.

AA-502      0.8      E 2-4 F-5

Goal. Evaluate the prospective ATI's ability to successfully/safely conduct and control, brief and debrief a multi-aircraft dissimilar flight.

Requirement. Conduct at least two setups from beyond visual range with emphasis on threat pre-merge formations and tactics, radar missile employment and defense to a IR missile reattack or disengagement. Additional emphasis placed on the brief and debrief.

External syllabus support. Two dissimilar adversaries.

c. Prerequisites

- (1) Secret Clearance.
- (2) Minimum of 100 hours in the F-5.
- (3) Designated ATP/Division Leader.
- (4) Completed course requirements.

d. Recertification. Former F-21 ATI's or Top Gun adversary course graduates will fly an AA-501 Evaluated mission demonstrating the ability to lead, brief, and debrief.

152. LOW ALTITUDE TACTICS (INSTRUCTOR) COURSE

1. Purpose. To produce an instructor capable of teaching low altitude tactics in a safe and progressive manner commensurate with an individual pilot's ability. The instructor will be able to recognize degradation in performance in low altitude tactics so that an individual will not be placed in an unsafe situation. The LAT(I) will establish minimum altitudes for various phases of low altitude flight on the basis of an individual's recent demonstrated performance, but not to exceed the T&R syllabus absolute minimum altitude.

2. General. Squadron academics syllabus consists of: (a) LAT concepts, (b) LAT considerations, (c) Formations, (d) Advanced maneuvering, (e) Instructor techniques.

3. Flight Training (2 Flights, 1.6 Hours)

LAT-510      0.8      E 2 F-5E/1 F-5F

Goal. Evaluate prospective LAT(I)'s knowledge of single aircraft LAT concepts and considerations to include the ability to safely conduct LAT.

Requirement. As a chased or single F-5F, conduct a LAT flight to include: straight and level acceleration/decelerations, minimum altitude capable with "S" turns, defensive break turns at a comfort level, ridgeline crossing, and terrain masking.

LAT-511      0.8      R 2 F-5

Goal. Evaluate prospective LAT(I)'s ability to brief, lead, and debrief section and chased maneuvering in the LAT environment.

Requirement. On first lap LAT(I) flies chase position on evaluator, on successive laps LAT(I) acts as section lead and conducts section maneuvering. Emphasis placed on brief, debrief, and safe conduct.

### 153. POST MAINTENANCE CHECK FLIGHT INSTRUCTOR

1. Purpose. To provide instructor pilots with standardized procedures and instructional techniques required to successfully complete a PMCF.

2. General. The syllabus consists of one hour of classroom instruction and a written exam.

#### 3. Flight Training (2 Flights, 1.6 Hours)

<u>PMCF-520</u>	<u>0.8</u>	<u>2 F-5/1 F-5F</u>
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Goal. Introduce normal and emergency PMCF procedures with PUI chased by instructor.

Requirement. Introduce ground and airborne PMCF procedures to include preflight start, takeoff, and inflight data recording.

<u>PMCF-521</u>	<u>0.8</u>	<u>R 1 F-5</u>
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Goal. Allow PUI to review all ground and airborne functional check flight procedures.

Requirement. As a solo, review all functional check flight procedures to include preflight, start, takeoff, and in-flight data.

## F-5 T&amp;R MANUAL

## T&amp;R MANUAL, F-5

AIRCRAFT: F-5                      MOS: 7523                      CREW  
 POSITION: PILOT

FLIGHT STAGE	TRAINING CODE	HRS	REFLY INTERVAL	CRP	C	R	REMARKS
<u>MISSION CAPABLE TRAINING</u>							
FAM	99	-.-	-	25.0	X		
	100	0.8	*	3.5	X		
	101	0.8	*	3.5	X		
	102	0.8	*	3.5	X		
	103	0.8	*	3.5	X		
	104	0.8	*	3.5	X	X	
	105	0.8	*	3.5	X	X	
	106	0.8	*	3.5	X	X	
INST	110	1.0	*	3.5	X	X	
AI	120	1.2	*	3.5	X		
	121	1.2	*	3.5	X		
<u>MISSION READY TRAINING</u>							
INST	200	1.0	3	0.5	X	X	
AA	210	0.8	6	1.0	X	X	
	211	0.8	8	1.0	X	X	
	212	0.8	8	1.0	X	X	
	213	0.8	8	1.0	X	X	
	214	0.8	8	1.0	X	X	
	215	0.8	8	1.0	X	X	
	216	0.8	6	1.0	X	X	
	217	0.8	6	1.0	X	X	
	218	0.8	6	1.0	X	X	
	219	0.8	8	1.0	X	X	
	220	0.8	8	1.0	X	X	
AI	230	1.0	9	0.5	X	X	
	231	1.0	9	0.5	X	X	
NAV	240	0.8	C	0.5	X	X	
LAT	250	0.8	6	0.5	X	X	
	251	0.8	6	0.5	X	X	
	252	0.8	6	0.5	X	X	
	253	0.8	6	0.5	X	X	

Figure 1-1.— MOS 7523 Refly Interval, Mission Readiness Percentage.



F-5 T&R MANUAL

FLIGHT STAGE	TRAINING CODE	HRS	REFLY INTERVAL	CRP	C	R	REMARKS
<u>MISSION QUALIFICATION TRAINING</u>							
AA	300	0.8	8	1.5	X	X	
	301	0.8	8	1.5	X	X	
	302	0.8	8	1.5	X	X	
	303	0.8	8	1.5	X	X	
	304	0.8	8	1.5	X	X	
	305	0.8	8	2.0	X	X	E
	306	0.8	8	1.0	X	X	
SA	320	0.8	C	1.5	X	X	
HA	330	0.8	6	1.5	X	X	
	331	0.8	6	1.5	X	X	
	332	0.8	6	2.0	X	X	E
SI	340	0.8	C	1.5	X	X	
	341	0.8	C	1.5	X	X	
<u>FULL-MISSION QUALIFICATION TRAINING</u>							
AA	410	0.8	8	1.5	X	X	
	411	0.8	8	1.5	X	X	
	412	0.8	8	1.5	X	X	
	413	0.8	8	1.5	X	X	
	414	0.8	8	2.0	X	X	
	415	0.8	8	2.0	X	X	
HA	420	0.8	C	2.0	X	X	
AAW	430	0.8	C	1.5	X	X	
	431	0.8	C	1.5	X	X	
<u>INSTRUCTOR AND SPECIAL FLIGHT REQUIREMENTS</u>							
ATI	500	0.8					E
	501	0.8					E
	502	0.8					E
LATI	510	0.8					E
	511	0.8					E
PMCF	520	0.8					
	521	0.8				X	
<u>REQUIRED TRAINING FLIGHTS</u>							
REQ	600	1.0	C			X	
	601	1.0	C			X	

Figure 1-1.— MOS 7523 Refly Interval, Mission Readiness Percentage, continued.

PILOT FLIGHT UPDATE CHAIN

<u>STAGE</u>	<u>FLIGHT</u>	<u>FLIGHT UPDATED</u>
INST	200	
AA	210	
	211	210
	212	210, 211
	213	210, 211, 212
	214	210, 211, 212, 213
	215	210, 211, 212, 213, 214
	216	
	217	216
	218	217, 217
	219	
	220	219
AI	230	
	231	230
NAV	240	
LAT	250	
	251	250
	252	250, 251
	253	250, 251, 252
AA	300	230, 231
	301	230, 231, 300
	302	230, 231, 300, 301
	303	230, 231, 300, 301, 302
	304	230, 231, 300, 301, 302, 303
	305	230, 231, 300, 301, 302, 303, 304
	306	230, 231, 300, 301, 302, 303, 304, 305
SA	320	
HA	330	250, 251
	331	250, 251, 330
	332	250, 251, 330, 331
SI	340	
	341	340
AA	410	230, 231
	411	230, 231, 410
	412	230, 231, 410, 411
	413	230, 231, 410, 411, 412
	414	230, 231, 410, 411, 412, 413
	415	230, 231, 410, 411, 412, 413, 414
HA	420	230, 231, 252, 253, 330, 331, 332
AAW	430	230, 231, 410, 411, 412, 413, 414
	431	230, 231, 410, 411, 412, 413, 414, 430

Figure 1-2.— MOS 7523 Pilot Flight Update Chaining.

<u>STAGE</u>	<u>FLIGHT</u>	<u>FLIGHT UPDATED</u>
ATI	500	
	501	
	502	
LATI	510	
	511	
PMCF	520	
	521	

Figure 1-2.— MOS 7523 Pilot Flight Update Chaining, continued.